Orokonui and the reintroduction of South Island robins

Photograph by Michael Jones

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Overview

- Background to the project
- Orokonui's role
- Alternative sites
- Hypotheses
- Robin monitoring
- My models
- Results
- Conclusions
- Looking forward
- Questions

Photograph by Neil Sweeney Bernard

Background

- Project first started 2007
- Monitoring pairs at two independent sites:
  - Silver Peaks
  - Silverstream
- Varying methods of predator control
- Focus on:
  - Nest daily survival rate
  - Adult seasonal survival
  - Juvenile seasonal survival and recruitment
- Monitor predator numbers

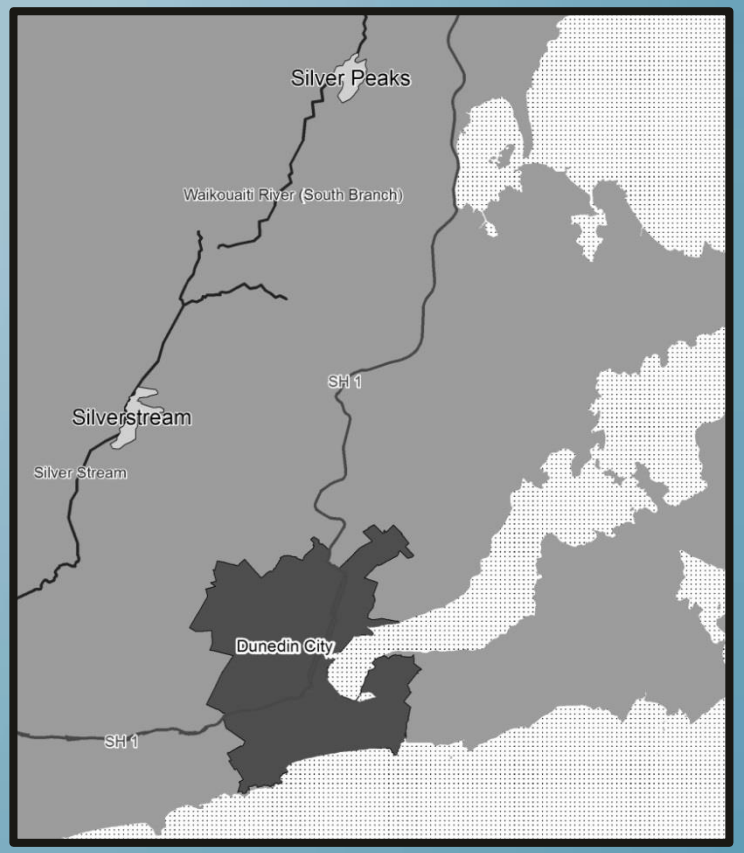
Orokonui's role

- Great opportunity
- 25 robins released in 2010
- Formed 2 breeding pairs
- 20 more released year after
- Monitoring has continued since summer 2010

Photograph by Leon Berard

Silverstream and Silver Peaks

Both in close proximity to Dunedin



Silverstream
- Kanuka forest
- Naturally occurring robin population
- Site of ongoing trapping since 2010

Silver Peaks
- Douglas fir plantation
- Naturally occurring robin population
- Site of aerial 1080 operation (with pre-feed) in 2011

Hypotheses

No mammalian predators=better conditions for survival and breeding

Adult survival:

- Higher at Orokonui than other two sites
- More stable at Orokonui

Daily Survival Rate (DSR):

- Higher at Orokonui than other two sites

Robin monitoring

Robin monitoring:

- Monitor adult birds (pairs and single birds)
- Monitor nests
- Monitor juveniles
- Colour banding

Photograph by Michael Jones

Predator surveys:

- Chew track cards

Post-season:

- Follow-up surveys of adjacent areas

My models!

Models produced using Rmark

Adult survival predictors:
- Time
- Area
- Sex

Used a Pradel survival model

Daily survival rate predictors:
- Time
- Area
- Nest stage

Used a nest survival model

Adult survival

- Sex was not a significant predictor, only area was

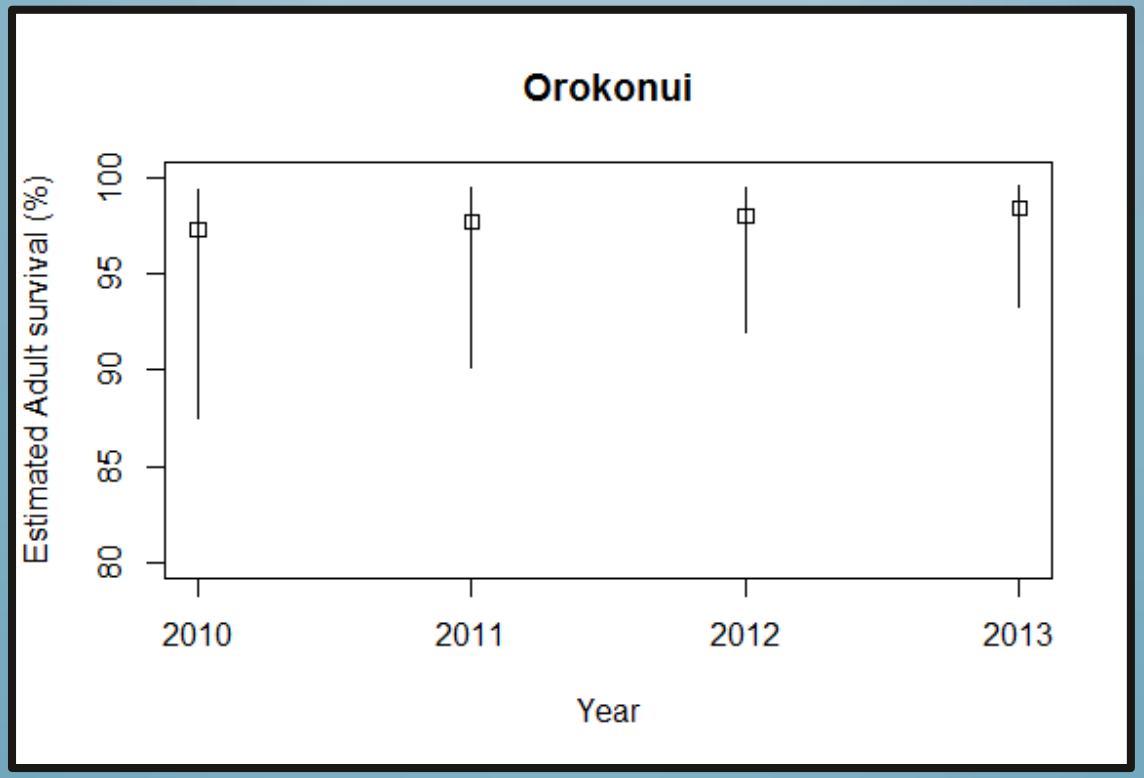


Figure one: Estimated adult survival and associated 95% confidence intervals for South Island robins (*Petroica australis australis*) at Orokonui for 2010/2011 to 2013/14 breeding seasons.

Adult survival: A comparison

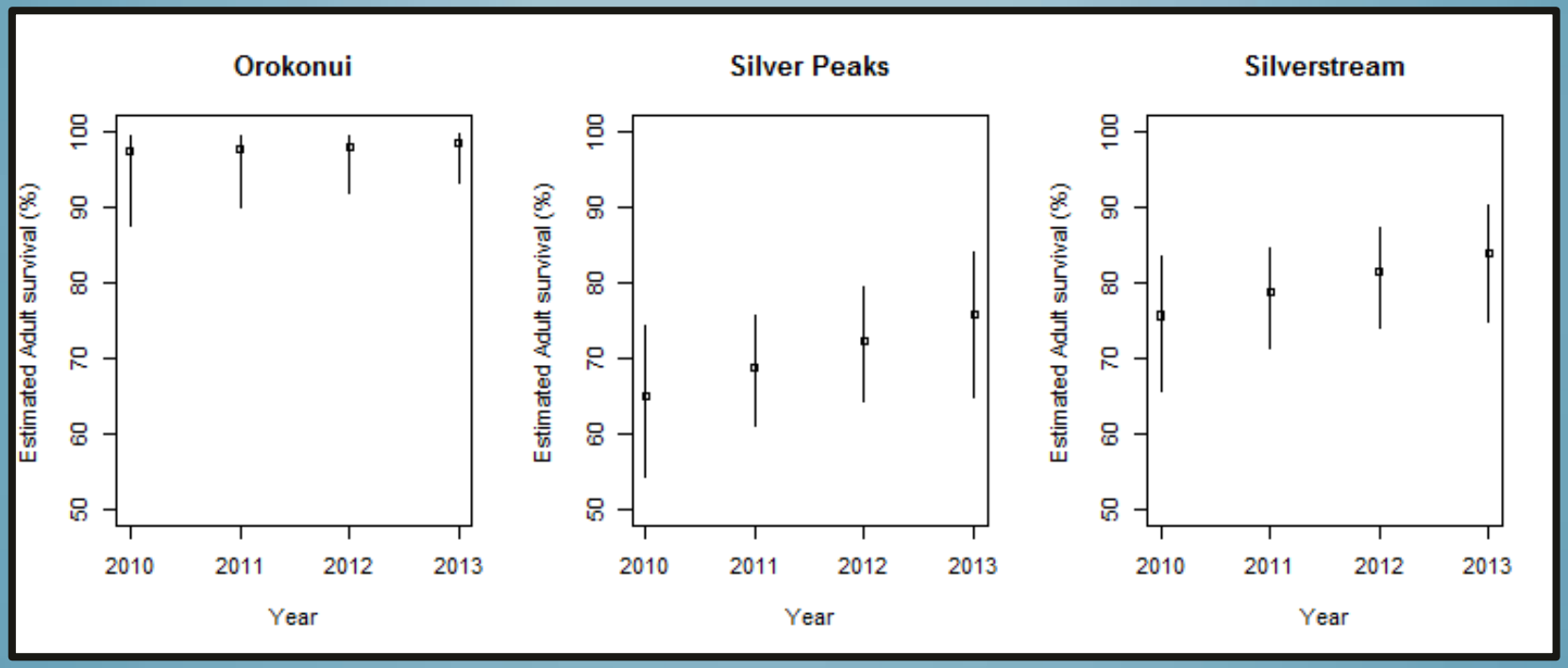


Figure two: Estimated adult survival and associated 95% confidence intervals for South Island robins (*Petroica australis australis*) at three sites (Orokonui, Silver Peaks and Silverstream) for 2010/11 to 2013/14 breeding seasons.

Daily Survival Rate

- Nest stage does not apply to Orokonui
- But can compare to other sites

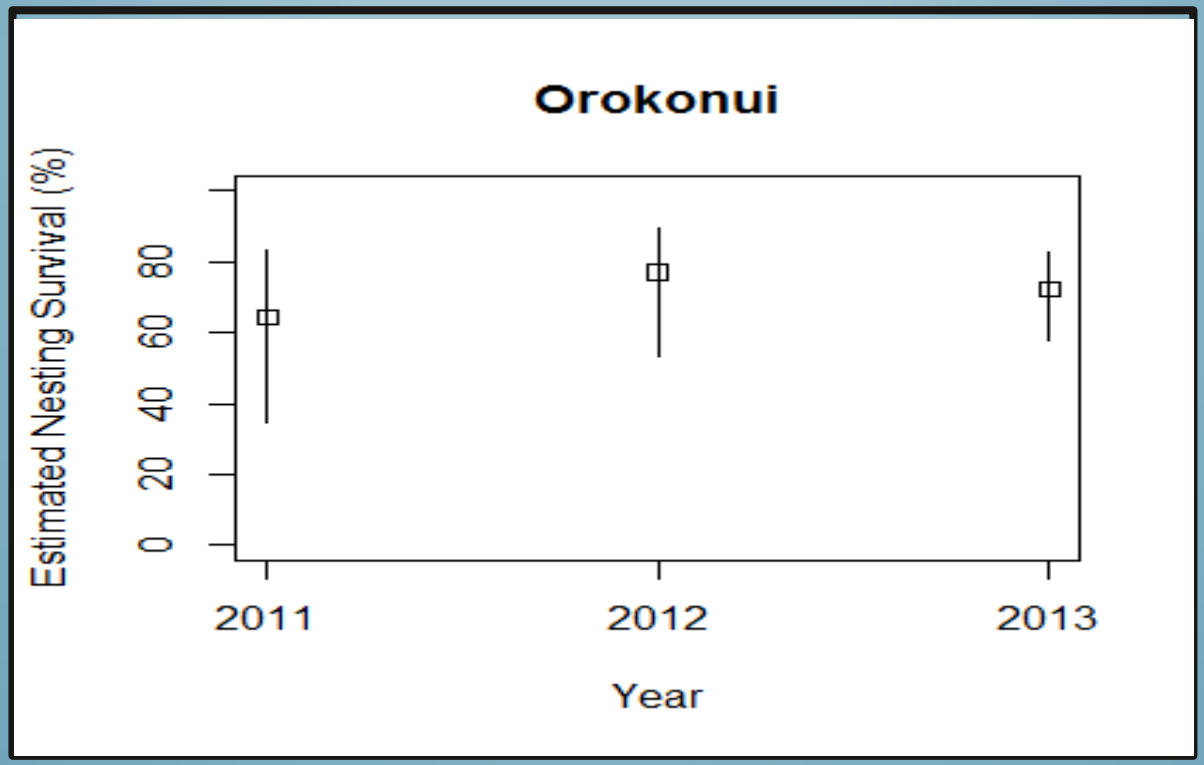


Figure three: Estimated nesting survival rate and associated 95% confidence intervals for South Island robins (*Petroica australis australis*) at Orokonui for 2011/2012 to 2013/2014 breeding seasons.
(Schadewinkel & Jamieson, 2014)

Daily Survival Rate: A comparison

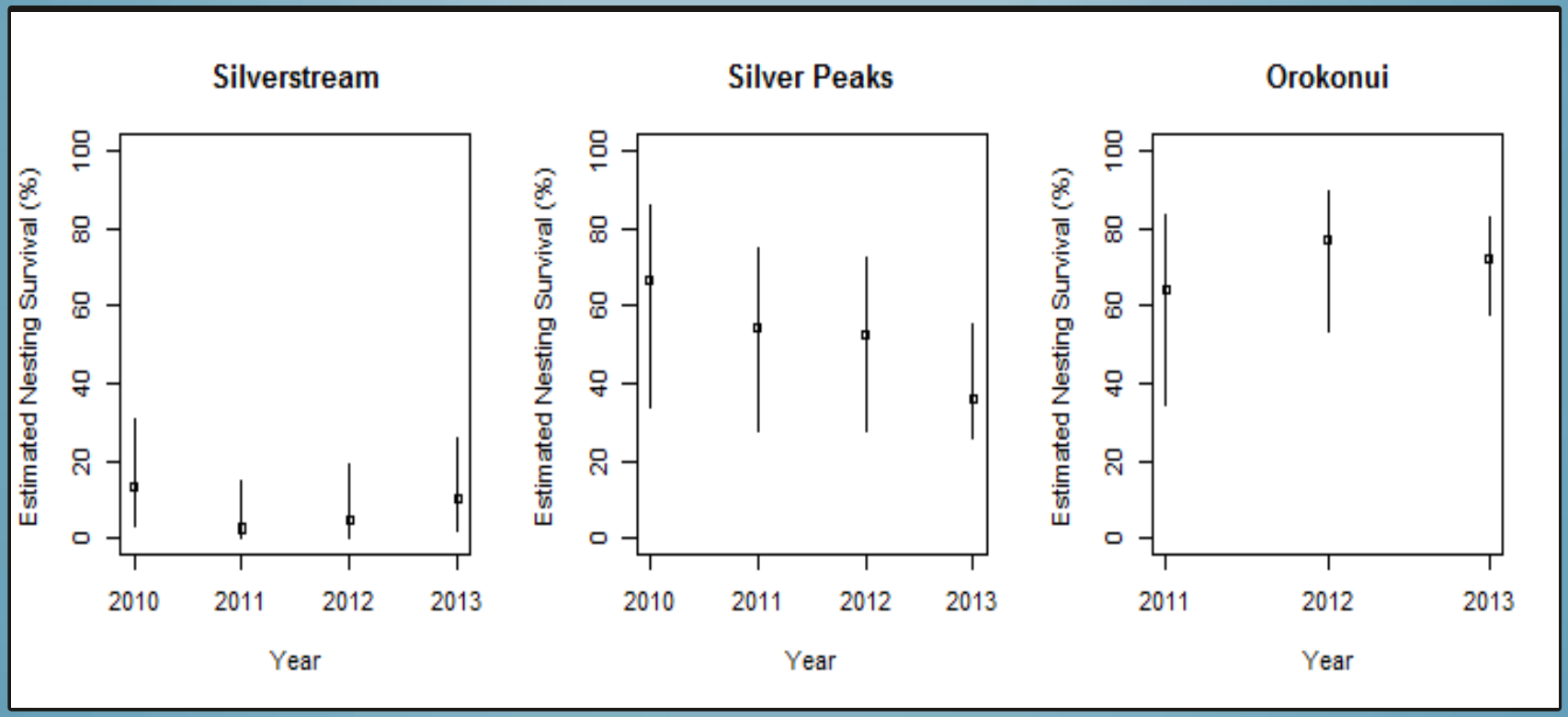


Figure four: Estimated nesting survival rate and associated 95% confidence intervals for South Island robins (*Petroica australis australis*) at three sites (Silverstream, Silver Peaks and Orokonui) for 2010/2011 (2011/2012 for Orokonui) to 2013/2014 breeding seasons.

(Schadewinkel & Jamieson, 2014)

Summary of results

At Orokonui:

Adult survival
- A greater adult survival rate
- An increasing adult survival rate
- A less variable adult survival rate

Nesting success
- A greater nesting success
- A decreasingly variable nesting success

What's going on?

Why is adult survival greater and less variable?

- No mammalian predators!
- More birds=better data
- May expect to see decrease if carrying capacity is reached
  - Birds leaving Orokonui/expanding outwards
  - Most likely juveniles

Juvenile recruitment analysis ongoing

Why is DSR greater and less variable?

- Again, no mammalian predators

Looking forward

Potentially beginning low-scale monitoring of robins next week

- Not as intensive as previous years

Continual monitoring at alternative sites

- Identify primary nest predators
- Investigate effectiveness of Richard Henry 'Goodnature' traps

Goodnature trap (www.goodnature.co.nz)

External surveys of Mopanui

Long-term goal

- To establish Orokonui as a stronghold for robins
- Allow them to colonise outward

Questions?

Special thanks to Robert Schadewinkel and Samantha Ray for past and present help with monitoring and to all summer research assistants.

Appendix: DSR

Table 1 Observed pairs, nests and apparent nesting success for the first two clutches of the season. Daily and nest survival rate estimates were derived the interaction model (Site * Year)

Site/Year	Pairs monitored	Nests monitored	Nests successful	Nesting success	Daily survival rate (DSR)	Est. nest survival*
Silver Peaks						
2010/2011	10	16	12	75%	98.97%	66.68%
2011/2012	12	21	14	67%	98.44%	54.12%
2012/2013	12	20	12	60%	98.35%	52.34%
2013/2014	16	24	10	42%	97.42%	36.08%
Silverstream						
2010/2011	10	16	2	13%	94.97%	13.34%
2011/2012	6	12	1	8%	91.15%	2.69%
2012/2013	6	11	0	0%	92.51%	4.79%
2013/2014	10	18	3	17%	94.35%	10.35%
Orokonui						
2010/2011	2	4	2	50%	ND	ND
2011/2012	10	19	14	74%	98.87%	64.28%
2012/2013	15	29	24	83%	99.33%	77.01%
2013/2014	39	64	51	80%	99.17%	72.25%

* Based on DSR value from interaction model (Site * Year) raised to the power of 39 (days for an entire nesting period)

(Schadewinkel & Jamieson, 2014)